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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/332,264	06/11/1999	THOMAS HUNTINGTON WOOD	WOOD27/56115	2709

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EXAMINER
LI, SHI K

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 03/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/332,264	Applicant(s) WOOD, THOMAS HUNTINGTON
	Examiner Shi K. Li	Art Unit 2633

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claim 1-2, 4-5, 7, 10 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. (U.S. Patent 5,311,344) in view of Manchester et al. (J. Manchester et al., "IP over SONET", IEEE Communication Magazine, May 1998, pp. 136-142).

Regarding claim 1, Bohn et al. discloses an optical access network (FIG. 1) comprising a head-end 2, a transport fiber 1, a star coupler 3, single mode fibers 4 and multiple subscriber terminals 5. The transport fiber, star coupler and single mode fiber comprise the outside plant. The subscriber terminal in Bohn et al. is equivalent to the network unit in the claimed invention. In the subscriber terminals, subcarrier modulation technique is used (col. 4, lines 39-47) so that different subscribers can simultaneously send data toward the head-end without collision.

However, Bohn et al. does not specify whether the user data is in packet format or not. Bohn et al. describes the upstream interface between the subscriber terminal and the user as 155.5 Mbps (OC-3) data signal.

Manchester et al. teaches standard ways to send packets over a SONET (or OC-N) data format. SONET is a popular standard for high-speed physical layer and packet is popular in user/application layer. Thus it would have been obvious to one of ordinary skill in the art at the

time the invention was made to use packet over SONET (or OC-N) standard to send user data in packet format over the optical network of Bohn et al. As Manchester et al. points out, such technique has been used by Internet service providers (ISPs) (see p.136, col.2, second paragraph).

Regarding claim 2, Bohn et al. uses subcarrier technique for modulating user data. The first signal is a carrier of 2.3 GHz and the second signal is a carrier of 2.6 GHz (col. 4 lines 42-44).

Regarding claim 4, Bohn et al. discloses optical subscriber terminals 5_1 and 5_2 in FIG. 1. Bohn et al. discloses the internal structure of these subscriber terminals in FIG. 2. They convert between optical signals and electrical signals and are optical subscriber terminals.

Regarding claim 5, Manchester et al. teaches standard ways to send packets over a SONET (or OC-N) data format. The upstream path in FIG. 1 of Bohn et al. is a point-to-point data link. Therefore it is logical to apply the method of Manchester et al. to encapsulate packets over PPP and OC-N frame. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to stack the protocol layers such that IP packets sit on top of PPP, which in turn sits on top of SONET/OC-N.

Regarding claims 7 and 10, Bohn et al. discloses the subscriber terminal in FIG. 2. The subscriber terminal accept upstream data; it has a VCO (modulator) 57; the VCO is tuned to a carrier frequency as explained in col. 4, lines 39-40; the VCO is modulated by the upstream data using frequency-shift keying (FSK) as explained in col. 4, lines 59-62; the subscriber terminal has a laser (transmitter) 55 which is coupled to the VCO and generate optical output to the coupler 51.

Regarding claim 13, Bohn et al. transmits a downstream data stream to the subscriber terminals via the transport fiber 1 (FIG. 1).

Regarding claim 14, Bohn et al. has a head-end 2, which includes a transmitter 23, a detector (receiver) 24 and a coupler (wavelength-division multiplexing device) 21 (FIG. 1). Bohn et al. also has subscriber terminals each of which includes a transmitter 55, a photodetector (receiver) 52 and a coupler (wavelength-division multiplexing device) 51 (FIG. 1). The couplers 21 and 51 couple optical signals of different wavelengths on the outside plant.

Regarding claim 15, Bohn et al. uses 1.5 μm wavelength for the receiver in the head-end and the transmitters in the subscriber terminals; it uses 1.3 μm wavelength for the transmitter in the head-end and the receivers in the subscriber terminals.

3. Claims 3, 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. in view of Manchester et al. as applied to claims 1-2, 4-5, 7, 10 and 13-15 above, and further in view of Irie et al. (K. Irie et al., "Large Capacity Multiplex-Port Brouter for Regional PC Communication Network System", IEEE 1998 International Zurich Seminar on Broadband Communications. Accessing, Transmission, Networking Proceedings, pp. 273-278).

Bohn et al. and Manchester et al. have been discussed in regard to claims 1 and 7. Irie et al. further teaches the conversion between HDLC and Ethernet in FIG. 1 and FIG. 3. Ethernet is popular for LAN interface while HDLC is popular for WAN interface. Therefore it is common practice to convert between Ethernet interface and HDLC/UNI/NNI at the point where LAN and WAN meet each other. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a Ethernet-HDLC/UNI/NNI conversion circuit either as adjunct units or incorporated as part of the ONU and head-end in the modified system of Bohn et

al. and Manchester et al. to convey data between the subscriber's LAN with the WAN maintained by the service provider.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. in view of Manchester et al. as applied to claims 1-2, 4-5, 7, 10 and 13-15 above, and further in view of Feldman et al. (U.S. Patent 6,137,607).

Bohn et al. and Manchester et al. have been discussed in regard to claims 1 and 7. Feldman et al. teaches the use of bias control for reducing optical beat interference as illustrated in FIG. 2. Feldman et al. describes the operation of the bias control 204 in col. 2, lines 60-67 such that the bias control circuit shuts off the laser (transmitter) in the absence of user data. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the bias control circuit into the modified system of Bohn et al. and Manchester et al. to reduce optical beat interference.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. in view of Manchester et al. as applied to claims 1-2, 4-5, 7, 10 and 13-15 above, and further in view of Bodeep et al. (U.S. Patent 5,822,102).

Bohn et al. and Manchester et al. have been discussed in regard to claims 1 and 7. The difference between the modified system of Bohn et al. and Manchester et al. and the claimed invention is the modulation method for upstream data. The modified system of Bohn et al. and Manchester et al. uses FSK while the current invention uses QPSK. Bodeep et al. teaches the use of QPSK modulation for upstream data in an access network (FIG. 4B, col. 1, line 35 and col. 3, lines 16-18). Thus it would have been obvious to one of ordinary skill in the art at the time the

invention was made to use QPSK instead of FSK in the modified system of Bohn et al. and Manchester et al.

6. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bohn et al. in view of Manchester et al. as applied to claims 1-2, 4-5, 7, 10 and 13-15 above, and further in view of Yamazaki et al. (U.S. Patent 5,872,644).

Bohn et al. and Manchester et al. have been discussed in regard to claims 1 and 7. The difference between the modified system based on Bohn et al. and Manchester et al. and the claimed invention is that the modified system of Bohn et al. and Manchester et al. uses 1.5 μm laser for the subscriber terminals while the current invention uses 1.3 μm laser for the ONUs. Yamazaki et al. teaches the use of 1.3 μm wavelength for the upstream data and the 1.5 μm wavelength for the downstream data (FIG. 8 and col. 6, lines 2-4). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to swap the wavelength used for the downstream data with the wavelength used for the upstream data, i.e., to use a 1.3 μm laser in the subscriber terminals and use a 1.5 μm laser in the head-end.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Darcie et al. (U.S. Patent 5,815,295) discloses an optical access network that uses multiple wavelengths.

b. Touma et al. (U.S. Patent 6,288,809) discloses an optical subscriber network with duplex protection.

c. Quayle (U.S. Patent 6,317,234) discloses an optical access network using MAC protocol for avoiding collision.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shi K. Li whose telephone number is 703 305-4341. The examiner can normally be reached on Monday-Friday (8:30 a.m. - 5:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703 305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9314 for regular communications and 703 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 305-3900.

skl
March 8, 2002

JASON CHAN
SUPERVISORY PATENT EXAMINER
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